

This document gives pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a **Minor, Industrial** permit. The discharge results from the operation of a potable water treatment plant. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9VAC25-260-00 et seq.

1. Facility Name and Mailing Address: Town of Orange WTP
119 Belleview Avenue
Orange, VA 22960
SIC Code : 4941

Facility Location: Town of Orange WTP
12996 Spicer's Mill Road
Orange, VA 22960
County: Orange

Facility Contact Name: Dwight Baker
Telephone Number: 540-672-1181
2. Permit No.: VA0053121
Expiration Date of previous permit: 10/11/2010

Other VPDES Permits associated with this facility: None

Other Permits associated with this facility: VA0021385 (the industrial sludge associated with this facility is pumped to the Town of Orange WWTP)

E2/E3/E4 Status: N/A
3. Owner Name: The Town of Orange Council
Owner Contact/Title: John Bailey/Town Manager
Telephone Number: 540-672-5005
4. Application Complete Date: 4/26/2010
Permit Drafted By: Anna Westernik
Date Drafted: 6/3/2010
Draft Permit Reviewed By: Alison Thompson
Date Reviewed: 6/10/2010
Public Comment Period : Start Date: 7/16/2010
End Date: 8/16/2010
5. Receiving Waters Information: See **Attachment 1** for the Flow Frequency Determination
Receiving Stream Name : UT to Poplar Run
Drainage Area at Outfall: 0.07 sq.mi.
River Mile: 3-XEU0.014
Stream Basin: Rappahannock River
Subbasin: None
Section: 4
Stream Class: III
Special Standards: None
Waterbody ID: VAN-E13R
7Q10 Low Flow: 0.0 MGD
7Q10 High Flow: 0.0 MGD
1Q10 Low Flow: 0.0 MGD
1Q10 High Flow: 0.0 MGD
Harmonic Mean Flow: 0.0 MGD
30Q5 Flow: 0.0 MGD
303(d) Listed: No
30Q10 Flow: 0.0 MGD
TMDL Approved: N/A
Date TMDL Approved: N/A
6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

<input checked="" type="checkbox"/> State Water Control Law	<input type="checkbox"/> EPA Guidelines
<input checked="" type="checkbox"/> Clean Water Act	<input checked="" type="checkbox"/> Water Quality Standards
<input checked="" type="checkbox"/> VPDES Permit Regulation	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> EPA NPDES Regulation	
7. Licensed Operator Requirements: N/A
8. Reliability Class: Class N/A

9. Permit Characterization:

<input type="checkbox"/> Private	<input type="checkbox"/> Effluent Limited	<input type="checkbox"/> Possible Interstate Effect
<input type="checkbox"/> Federal	<input checked="" type="checkbox"/> Water Quality Limited	<input type="checkbox"/> Compliance Schedule Required
<input type="checkbox"/> State	<input checked="" type="checkbox"/> Toxics Monitoring Program Required	<input type="checkbox"/> Interim Limits in Permit
<input type="checkbox"/> POTW	<input type="checkbox"/> Pretreatment Program Required	<input type="checkbox"/> Interim Limits in Other Document
<input checked="" type="checkbox"/> WTP	<input type="checkbox"/> TMDL	

10. Wastewater Sources and Treatment Description:

The Town of Orange Water Treatment Plant (WTP) produces potable water for the Town of Orange and the Rapidan Service Authority that serves Orange County. The Town withdraws water from the Rapidan River, upstream from its confluence with Poplar Run, and stores it in a 45 MG raw water reservoir.

From the reservoir, water is then pumped up to the WTP where alum and lime are added before the water flows into twin flocculation basins. Once a floc is formed, the flows enter twin sedimentation basins. After settling occurs, water flows inside the building, for filtration by three conventional sand filters. After filtration soda ash, hydrofluorosilic acid, and chlorine are added prior to storage in the clear wells and eventual distribution to the system.

Backwash and sedimentation basin cleanout wastewater discharges daily to one of four decant basins, each sized to hold 0.06 MG. Decant basin-settled solids are pumped to the Town of Orange WWTP for additional treatment and disposal. "Decant" wastewater is tested for the presence of residual chlorine before being discharged via the H-flume to the Unnamed Tributary (UT) of Poplar Run. When chlorine is detected, operators manually start the automated dechlorination system that feeds sodium metabisulfite to the wastewater immediately prior to its discharge into the flume. Wastewater is held in the decant basins at least 24 hours before discharge to allow proper settling. Additional wastewater flow occurs quarterly when the flocculation and sedimentation basins are cleaned and annually when the clearwell is drained.

The permit application states that the facility discharges an average of 6 hours per day/5 days per week. Therefore the discharge is considered to be intermittent and only acute water quality criteria will be used to determine the need for effluent limits.

See **Attachment 2** for the NPDES Permit Rating Worksheet.

See **Attachment 3** for a facility schematic/diagram.

TABLE 1 – Outfall Description

Outfall Number	Discharge Sources	Treatment	Max 30-day Flow	Outfall Latitude and Longitude
001	Production of Potable Water	See Item 10 above.	0.14 MGD	38° 15' 50" N 78° 09' 22" W

See **Attachment 4** for Madison Mills Quadrangle (DEQ #185C) topographic map.

11. Solids Treatment and Disposal Methods:

Solids are generated from filter backwash activities and from water treatment sedimentation basins cleaning. Aluminum sulfate (alum) and lime is added to the raw water in a rapid mix flocculation chamber. The solids settle in the sedimentation basins and are periodically cleaned out and pumped to the decant basins. The wastewater is discharged from the basins to the UT of Poplar Run and the solids are pumped to the Town of Orange WWTP for additional treatment and ultimate disposal.

12. **Discharges, Intakes, Monitoring Stations, Other Items in Vicinity of Discharge** (see **Attachment 5**)
13. **Material Storage** (See **Attachment 6** for a list of materials stored and spill containment measures.)
14. **Site Inspection:** Performed by Anna Westernik and Rebecca Johnson on May 13, 2010 (see **Attachment 7**).
15. **Receiving Stream Water Quality and Water Quality Standards:**
- a) Ambient Water Quality Data
There are no DEQ monitoring stations on the unnamed tributary to Poplar Run and the stream is not on the 303(d) list. Monitoring Station 3-RAP045.08, located 3.3 miles downstream of Outfall 001, is the nearest monitoring station to the discharge. Sampling at this station has discovered a bacteriological impairment. However, the Town of Orange WTP is not likely to discharge bacteria.

See **Attachment 8**, Planning Statement dated May 24, 2010.
- b) Receiving Stream Water Quality Criteria
Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, an UT of Poplar Run, is located within Section 4 of the Rappahannock River Basin and is a Class III water.

Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, and a temperature that does not exceed 32°C at all times. Additionally, they must maintain a pH of 6.0-9.0 standard units (S.U.).

Attachment 9 details other water quality criteria applicable to the receiving stream. Since ammonia is not a pollutant of concern in this discharge, no criteria development for this pollutant is necessary.

Metals Criteria:
The Water Quality Criteria for some metals are dependent on the receiving stream's hardness (expressed as mg/l calcium carbonate). The 7Q10 of the receiving stream is zero and no ambient data is available; the effluent data for hardness can be used to determine the metals criteria. The average hardness of the effluent calculated using three samples taken in April 2010 is 33 mg/L. The hardness-dependent metals criteria shown in **Attachment 9** are based on this value.
- c) Receiving Stream Special Standards
The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, an UT of Poplar Run, is located within Section 4 of the Rappahannock River Basin. This section has not been designated with a special standard designation at this time.
- d) Threatened or Endangered Species
The Virginia DGIF Fish and Wildlife Information System Database was searched on May 21, 2010 for records to determine if there are threatened or endangered species in the vicinity of the discharge. Threatened and endangered species were identified within a 2 mile radius of the discharge. The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and therefore, protect the threatened and endangered species found near the discharge.
16. **Antidegradation (9VAC25-260-30):**

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2

water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream is a dry ditch and has been classified as Tier 1 since it has a 7Q10 of zero and at all times will be comprised of only effluent from this industrial facility. Permit limits proposed have been established by determining wasteload allocations that will result in attaining and/or maintaining all water quality criteria applicable to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development :

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards (WQS) are determined for the pollutants in the effluent, and the Wasteload Allocations (WLAs) are calculated. Since the critical flows 7Q10 and 1Q10 have been determined to be zero, the WLA's are equal to the WQS in this instance. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are based on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a) Effluent Screening:

Effluent data obtained from the permit application has been reviewed and determined to be suitable for evaluation. Please see **Attachment 10** for a summary of effluent data. Sulfate, magnesium, barium, manganese, copper, and chloroform were found to be present above the quantifiable level. A wasteload allocation analysis for copper alone was conducted because there are acute criteria for this parameter.

b) Mixing Zones and Wasteload Allocations (WLAs):

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f)(Q_s)] - [(C_s)(f)(Q_s)]}{Q_e}$$

Where:

WLA	=	Wasteload allocation
C _o	=	In-stream water quality criteria
Q _e	=	Design flow
Q _s	=	Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; 30Q10 for aquatic ammonia criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
f	=	Decimal fraction of critical flow
C _s	=	Mean background concentration of parameter in the receiving stream.

The water segment receiving the discharge via Outfall 001 is considered to have a 7Q10 and 1Q10 of 0.0 MGD. As such, there is no mixing zone and the WLA is equal to the C_o.

Staff derived wasteload allocations where parameters are reasonably expected to be present in an effluent (e.g., total residual chlorine where chlorine is used as a means of disinfection) and where effluent data indicate the pollutant is present in the discharge above quantifiable levels. With regard to the Outfall 001 discharge, total residual chlorine may be present since chlorine is used for disinfection of the drinking water,

and monitoring data from March 2010 indicate copper is present in the discharge (other pollutants are present in the discharge but there were no acute water quality criteria associated with these—See Part 17.a of this fact sheet). **Attachment 9** details the WLA derivations for these pollutants.

c) Effluent Limitations Toxic Pollutants, Outfall 001

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits. Since the discharge is intermittent, only acute WLAs were used to derive limits.

The VPDES Permit Regulation at 9VAC25-31-230.D. requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Total Residual Chlorine (TRC):

Chlorine is used for disinfection at the water treatment plant and is potentially present in the discharge. The current permit limits of 0.011 mg/L monthly average and 0.011 mg/L maximum were derived from the General Permit for Potable Water Treatment Plants (9 VAC 25-860). These limits replace the current permit limits of 0.013 mg/L monthly average and 0.019 mg/L maximum.

2) Metals/Organics:

No limits for copper are needed (**Attachment 11**). The chloroform level of 29 µg/L detected in the March 2010 sampling event is well below the human health criteria of 11,000 µg/L. There are no water quality criteria for sulfate, magnesium, barium, and manganese.

d) Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants
No changes to total suspended solids (TSS) and pH limitations are proposed.

e) Effluent Limitations and Monitoring Summary.

The effluent limitations are presented in the table found in Section 19 of this fact sheet. Limits were established for Flow, Total Suspended Solids (TSS), pH, and TRC.

The limits for TSS, pH, and TRC are based on the General Permit for Potable Water Treatment Plants (9 VAC 25-860).

Sample Type and Frequency are in accordance with the General Permit for Potable Water Treatment Plants (9 VAC 25-860).

18. Antibacksliding:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

19. Effluent Limitations/Monitoring Requirements: Industrial Process Water Discharge

Maximum Flow of this Industrial Facility is 0.14 MGD.

Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Daily Maximum	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	N/A	NL	N/A	N/A	NL	1/M	Estimate
TSS (mg/L)	1	30 mg/l	60 mg/l	N/A	N/A	1/M	5G/8H
pH (S.U.)	1	N/A	N/A	6.0 S.U.	9.0 S.U.	1/M	Grab
Total Residual Chlorine	1	0.011 mg/l	N/A	N/A	0.011 mg/l	1/M	Grab
Acute Toxicity – <i>C. dubia</i> (TU _d)	N/A	N/A	N/A	N/A	NL	1/Y	5G/8H
Acute Toxicity – <i>P. promelas</i> (TU _d)	N/A	N/A	N/A	N/A	NL	1/Y	5G/8H

The basis for the limitations codes are:

1. General Permit for Potable Water
Treatment Plants (9 VAC 25-190)

MGD = Million gallons per day.

N/A = Not applicable.

NL = No limit; monitor and report.

S.U. = Standard units.

1/M = Once per month.

1/Y = Once per year.

Estimate = Reported flow is to be based on the technical evaluation of the sources contributing to the discharge.

5G/8H = Eight Hour Composite – Consisting of five (5) grab samples collected at hourly intervals until the discharge ceases or five (5) grab samples at equal time intervals for the duration of the discharge if less than 8 hours in length.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

20. Other Permit Requirements:

- a) Part I.B. of the permit contains quantification levels and compliance reporting instructions. 9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.
- b) Permit Section Part I.C., details the requirements for Toxics Management Program. The VPDES Permit Regulation at 9VAC25-31-210 requires monitoring and 9VAC25-31-220.I requires limitations in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. A TMP is imposed for those determined by the Board to have the potential for toxicity or in-stream impact based on an evaluation of manufacturing processes, indirect discharges, treatment processes, effluent or receiving stream data or other relevant information.

The Town of Orange Water Treatment Plant is an industrial discharger with an effluent that may be potentially toxic. The facility completed the initial acute toxicity testing and the effluent passed the decision criteria. The facility was then required to conduct annual monitoring for the duration of the permit's term. Annual TMP monitoring will be maintained during this permit term. See **Attachment 12** for the most recent review of the bioassays for Outfall 001.

Since the discharge is considered intermittent, annual acute testing was required during the last permit term. It is proposed that acute testing be continued using *C. dubia* and *P. promelas* as the test species.

21. Other Special Conditions:

- a) O&M Manual Requirement. Required by Code of Virginia §62.1-44.19; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall submit an Operations and Maintenance (O&M) Manual or a statement confirming the accuracy and completeness of the current O&M Manual to the Department of Environmental Quality, Northern Regional Office (DEQ-NRO) by January 10, 2011. Future changes to the facility must be addressed by the submittal of a revised O&M Manual by within 90 days of the change(s). Non-compliance with the O&M Manual shall be deemed a violation of the permit.
- b) Residuals Handling/Disposal Plan. The permittee shall submit a comprehensive Residuals Handling/Disposal Plan to the Department of Environmental Quality, Northern Regional Office (DEQ-NRO) by January 10, 2011. The permittee shall conduct all residuals handling and disposal activities in accordance with an approved Residuals Handling/Disposal Plan. At a minimum, this plan shall include information about the volume of residuals created per quarter, storage and transfer between decant basins, method of disposal to include detailed schematics showing how the residuals are delivered to the Town of Orange WWTP, information about alternative disposal options, and protocol for analysis of the residuals.

Any proposed changes in the residuals handling and/or disposal procedures followed by the permittee shall be documented and submitted for Virginia Department of Environmental Quality review and approval no less than 90 days prior to the effective date of the changes.

- c) Notification Levels The permittee shall notify the Department as soon as they know or have reason to believe:
- a. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this permit, if that discharge will exceed the highest of the following notification levels:
 - (1) One hundred micrograms per liter;
 - (2) Two hundred micrograms per liter for acrolein and acrylonitrile; five hundred micrograms per liter for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter for antimony;
 - (3) Five times the maximum concentration value reported for that pollutant in the permit application; or
 - (4) The level established by the Board.
 - b. That any activity has occurred or will occur which would result in any discharge, on a nonroutine or infrequent basis, of a toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following notification levels:
 - (1) Five hundred micrograms per liter;
 - (2) One milligram per liter for antimony;
 - (3) Ten times the maximum concentration value reported for that pollutant in the permit application; or
 - (4) The level established by the Board.
- d) Materials Handling/Storage. 9VAC25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and §62.1-44.17 authorize the Board to regulate the discharge of industrial waste or other waste.
- e) Minimum Freeboard. The permittee shall maintain a minimum freeboard of one (1) foot in the decant basins except during the occurrence of a 25-year, 24-hour storm event. Should the one-foot freeboard requirement be violated, the permittee shall immediately notify DEQ-NRO describing measures taken to correct the problem. Within five (5) days of the notification, the permittee shall submit a written explanation statement and corrective measures.
- f) TMDL Reopener. This special condition is to allow the permit to reopened if necessary to bring it in compliance with any applicable TMDL that may be developed and approved for the receiving stream.

22. Permit Section Part II:

Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Changes to the Permit from the Previously Issued Permit:

- a) Special Conditions:
 - 1) A Residuals Handling/Disposal Plan Special Condition has been added.
 - 2) A Minimum Freeboard Special Condition has been added.
- b) Monitoring and Effluent Limitations:
 - 1) The TRC limits were changed from 0.013 mg/L monthly average and 0.019 mg/L maximum to reflect the values in the General Permit for Potable Water Treatment Plants, 9 VAC 25-190 (0.011 mg/L monthly average and 0.011 mg/L maximum).

24. Variances/Alternate Limits or Conditions: None

25. Public Notice Information:

First Public Notice Date: 7/16/2010

Second Public Notice Date: 7/23/2010

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting Anna Westernik at the DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193 (Telephone No. (703) 583-3837; e-mail anna.westernik@deq.virginia.gov). See **Attachment 13** for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

26. 303 (d) Listed Stream Segments and Total Max. Daily Loads (TMDL):

This facility discharges to a downstream segment beginning with the confluence with Poplar Run and continuing until the confluence with the Robinson River (RAP01A00) that was listed for a fecal coliform impairment from 2002 through 2004 and an *E. coli* impairment in 2006. This segment was included in the Rapidan River Bacteria TMDL that was approved by EPA on December 5, 2007. Two additional downstream segments that are impaired for bacteria will not receive a TMDL because they are nested with the completed bacteria TMDL. The Town of Orange WTP did not receive a WLA, as it is not expected to discharge bacteria (see **Attachment 8**, Planning Statement dated May 24, 2010 for the Town of Orange WTP).

27. Additional Comments:

Previous Board Action(s): On August 29, 2009, the Town of Orange Water Treatment Plant staff reported an August 28, 2009 overflow of approximately 80,000 gallons of water containing 20,000 gallons of alum sludge into the Rapidan River to the Department of Environmental Quality, Northern Regional Office (DEQ-NRO). As a result of the reported discharge, DEQ-NRO issued a Notice of Violation (NOV) to the Town, dated October 9, 2009.

On November 17, 2009, the town manager and the water treatment plant operator met with DEQ staff to discuss the NOV. The Town's representatives stated that the overflow occurred because the operator thought the settling basin pumps were on the off position. Instead, the switch was on auto and when the sludge/water level reached a high enough level the decant pumps started automatically and discharged through Outfall 001. At the meeting, the Town provided a protocol for dumping the settling basin and had indicated the Town had run a mock exercise on November 12, 2009. In addition to the NOV, a recent failure of the toxics testing (TMP) was discussed. The Town stated they thought that the failing TMP was a result of a sampling error. At the meeting the need for the solids management plan for the WTP was also discussed.

The Town provided documentation to DEQ-NRO dated December 8, 2009 detailing multiple steps to resolve the violations and prevent future incidents at the WTP. The steps included: the installation of new control panels for the decant basin on December 8, 2009, facilitating predictable and correct operation; the passing retest for toxics on November 30, 2009; a plan for handling WTP settling process sludge; and the solids residual plan. These steps have demonstrated that the Town has resolved the issues that led to the violations. Therefore, the violations set forth in the NOV were resolved and the case was dereferred on May 26, 2010.

Staff Comments: None

Public Comment: No comments were received during the public notice period.

EPA Checklist: The checklist can be found in **Attachment 14**.

Attachments to Fact Sheet for VPDES Permit No. VA0053121

Attachment 1	Flow Frequency Determination
Attachment 2	NPDES Permit Rating Worksheet
Attachment 3	Facility Schematic/Diagram
Attachment 4	Madison Mills Quadrangle (DEQ #185C) Topographic Map
Attachment 5	Active VPDES Permits in Waterbody VAN-E13R
Attachment 6	List of Materials Stored and Spill Containment Measures
Attachment 7	Memorandum Detailing May 13, 2010 Site Visit
Attachment 8	Planning Statement Dated May 24, 2010
Attachment 9	Water Quality Criteria and WLAs
Attachment 10	Summary of Effluent Data
Attachment 11	Derivation of Copper Limits
Attachment 12	Bioassay Review of Testing Conducted in December 2009
Attachment 13	Copy of the Public Notice Document
Attachment 14	EPA Permit Checklist

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

Office of Water Quality Assessments

629 East Main Street P.O. Box 10009 Richmond, Virginia 23219

SUBJECT: Flow Frequency Determination
Town of Orange WTP - #VA0053121

TO: Cathy Malast, NRO

FROM: Paul E. Herman, P.E., WQAP *Paul*

DATE: April 12, 2000

COPIES: Ron Gregory, Charles Martin, File

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APR 14 2000

Northern VA. Region
Dept. of Env. Quality

This memo supersedes my December 19, 1994, memo to Jennie Dollard concerning the subject VPDES permit. This memo addresses the recent changes to the WTP outfalls.

The Town of Orange WTP discharges to an unnamed tributary of Poplar Run near Madison Mills, VA. Flow frequencies are required at this site for use by the permit writer in developing effluent limitations for the VPDES permit.

At the discharge point, the unnamed tributary is shown as a dry ditch on the USGS Madison Mills Quadrangle topographic map. The flow frequencies for dry ditches are 0.0 cfs for the 1Q10, 7Q10, 30Q5, high flow 1Q10, high flow 7Q10, and harmonic mean.

If it is determined that flow frequencies are needed for Poplar Run at its confluence with the dry ditch, please use the flow data provided for Poplar Run at the discharge point as listed in my December 19, 1994, memo to Jennie Dollard.

If you have any questions concerning this analysis, please let me know.

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

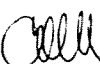
13901 Crown Court

Northern Virginia Regional Office
Woodbridge, Virginia 22193

(703)583-3800

Subject: **FLOW FREQUENCY REQUEST FORM**

To: Paul E. Herman, OWPS-Office of Water Quality Assessment

From: Cathy K. Malast, NVRO (ext. 3853) 

Date: April 11, 2000

Facility Name: Town of Orange, Water Treatment Plant

Permit Number: VPDES Permit No. VA0053121

Permit Type: Minor, Industrial

Permit Action: Reissuance

Flow Frequencies Needed: 1Q10 (low and high) 7Q10 (low and high)
30Q5 (low and high) Harmonic Mean Other: N/A

Outfall Description:

#	Latitude	Longitude	Receiving Stream	Drainage Area ¹	7Q10 ¹
001	38° 15' 50"	78° 09' 22"	Unnamed tributary to Poplar Run	8.65 mi ²	0.10 cfs

Current Reference Gaging Station (if available)¹:

Name	Number	Drainage Area	7Q10
Rapidan River near Culpeper, VA	01667500	472 mi ²	20.8 cfs
Poplar Run near Madison Mills, VA	02047460	8.75 mi ²	0.10 cfs

Comments: Prior to consolidation into one new Outfall 001, Outfalls 001-003 were located as follows:

Outfall 001	Latitude	38° 15' 45"	Longitude	78° 09' 22"	UT to Poplar Run
Outfall 002	Latitude	38° 15' 45"	Longitude	78° 09' 22"	UT to Poplar Run
Outfall 003	Latitude	38° 15' 45"	Longitude	78° 09' 18"	Poplar Run

Permit expires April 30, 2000.

Enclosure: Portion of topo map 185C (Orange)

Flow Frequency Determination Memorandum dated December 19, 1994 re: Orange WTP

¹ From previous determination detailed in memo dated December 19, 1994.

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
Water Quality Assessments and Planning
629 E. Main Street P.O. Box 10009 Richmond, Virginia 23240

SUBJECT: Flow Frequency Determination
Orange WTP - #VA0053121

TO: Jennie Dollard, NRO

FROM: Paul Herman, OWRM-WQAP *Paul*

DATE: December 19, 1994

COPIES: Ron Gregory, Charles Martin, Dale Phillips, Curt Wells,
File



The Orange WTP discharges to the Poplar Run near Madison Mills, VA. Stream flow frequencies are required at this site by the permit writer for the purpose of calculating effluent limitations for the VPDES permit.

The USGS conducted several flow measurements on Poplar Run from 1989 to 1992. The measurements were made approximately 0.25 miles downstream of the discharge point at the Route 633 bridge. The measurements made by the USGS correlated very well with the same day daily mean values from the continuous record gage on the Rapidan River near Culpeper, VA #01667500. The measurements and daily mean values were plotted on a logarithmic graph and a best fit line was drawn through the data points. The required flow frequencies from the reference gage were plotted on the regression line and the associated flow frequencies at the measurement site were determined from the graph.

The flow frequencies at the discharge point were determined by using the values at the measurement site and adjusting them by proportional drainage areas. The data for the reference gage, the measurement site and the discharge point are presented below:

Rapidan River near Culpeper, VA (#01667500):

Drainage Area = 472 mi²

1Q10 = 12.8 cfs	High Flow 1Q10 = 78.9 cfs
7Q10 = 20.8 cfs	High Flow 7Q10 = 103 cfs
30Q5 = 48.3 cfs	HM = 173 cfs

Poplar Run near Madison Mills, VA (#02047460):

Drainage Area = 8.75 mi²

1Q10 = 0.05 cfs	High Flow 1Q10 = 0.58 cfs
7Q10 = 0.10 cfs	High Flow 7Q10 = 0.88 cfs
30Q5 = 0.31 cfs	HM = 1.70 cfs

Poplar Run at discharge point:

Drainage Area = 8.65 mi ²	
1Q10 = 0.05 cfs	High Flow 1Q10 = 0.57 cfs
7Q10 = 0.10 cfs	High Flow 7Q10 = 0.87 cfs
30Q5 = 0.31 cfs	HM = 1.68 cfs

The high flow months are December through May.

This analysis assumes there are no significant discharges, withdrawals or springs influencing the flow in Poplar Run between the measurement site and the discharge point.

If there are any questions concerning this analysis, please let me know.

NPDES PERMIT RATING WORK SHEET

VPDES NO. : VA0053121

- ☒ Regular Addition
☐ Discretionary Addition
☐ Score change, but no status Change
☐ Deletion

Facility Name: Town of Orange Water Treatment Plant

City / County: Orange

Receiving Water: Poplar Run, UT

Reach Number:

Is this facility a steam electric power plant (sic =4911) with one or more of the following characteristics?

1. Power output 500 MW or greater (not using a cooling pond/lake)
 2. A nuclear power Plant
 3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

- ☐ YES; score is 700 (stop here)
☒ NO; (continue)

☐ Yes; score is 600 (stop here) ☒ NO; (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: _____ Primary Sic Code: 4941 Other Sic Codes: _____
 Industrial Subcategory Code: 000 (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
<input type="checkbox"/> No process waste streams	0	0	<input type="checkbox"/> 3.	3	15	<input checked="" type="checkbox"/> 7.	7	35
<input type="checkbox"/> 1.	1	5	<input type="checkbox"/> 4.	4	20	<input type="checkbox"/> 8.	8	40
<input type="checkbox"/> 2.	2	10	<input type="checkbox"/> 5.	5	25	<input type="checkbox"/> 9.	9	45
			<input type="checkbox"/> 6.	6	30	<input type="checkbox"/> 10.	10	50

Code Number Checked: 7
Total Points Factor 1: 35

FACTOR 2: Flow/Stream Flow Volume

(Complete either Section A or Section B; check only one)

Section A – Wastewater Flow Only considered

Wastewater Type (see Instructions)	Code	Points
Type I: Flow < 5 MGD	<input type="checkbox"/> 11	0
Flow 5 to 10 MGD	<input type="checkbox"/> 12	10
Flow > 10 to 50 MGD	<input type="checkbox"/> 13	20
Flow > 50 MGD	<input type="checkbox"/> 14	30
Type II: Flow < 1 MGD	<input checked="" type="checkbox"/> 21	10
Flow 1 to 5 MGD	<input type="checkbox"/> 22	20
Flow > 5 to 10 MGD	<input type="checkbox"/> 23	30
Flow > 10 MGD	<input type="checkbox"/> 24	50
Type III: Flow < 1 MGD	<input type="checkbox"/> 31	0
Flow 1 to 5 MGD	<input type="checkbox"/> 32	10
Flow > 5 to 10 MGD	<input type="checkbox"/> 33	20
Flow > 10 MGD	<input type="checkbox"/> 34	30

Section B – Wastewater and Stream Flow Considered

Wastewater Type (see Instructions)	Percent of Instream Wastewater Concentration at Receiving Stream Low Flow	Code	Points
Type I/III:	< 10 %	<input type="checkbox"/> 41	0
	10 % to < 50 %	<input type="checkbox"/> 42	10
	> 50%	<input type="checkbox"/> 43	20
Type II:	< 10 %	<input type="checkbox"/> 51	0
	10 % to < 50 %	<input type="checkbox"/> 52	20
	> 50 %	<input type="checkbox"/> 53	30

Code Checked from Section A or B: 21
Total Points Factor 2: 10

NPDES PERMIT RATING WORK SHEET**FACTOR 3: Conventional Pollutants**

(only when limited by the permit)

A. Oxygen Demanding Pollutants: (check one) ☐ BOD ☐ COD ☐ Other: _____

Permit Limits: (check one)

☐
☐
☐
☐

< 100 lbs/day
 100 to 1000 lbs/day
 > 1000 to 3000 lbs/day
 > 3000 lbs/day

Code	Points
1	0
2	5
3	15
4	20

Code Number Checked:

N/A

Points Scored:**0**

B. Total Suspended Solids (TSS)

Permit Limits: (check one)

☐
☒
☐
☐

< 100 lbs/day
 100 to 1000 lbs/day
 > 1000 to 5000 lbs/day
 > 5000 lbs/day

Code	Points
1	0
2	5
3	15
4	20

Code Number Checked:

2

Points Scored:**5**

C. Nitrogen Pollutants: (check one)

☐

Ammonia

☐

Other: _____

Permit Limits: (check one)

☐
☐
☐
☐

Nitrogen Equivalent
 < 300 lbs/day
 300 to 1000 lbs/day
 > 1000 to 3000 lbs/day
 > 3000 lbs/day

Code	Points
1	0
2	5
3	15
4	20

Code Number Checked:

NA

Points Scored:**0****Total Points Factor 3:****5****FACTOR 4: Public Health Impact**

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this include any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above reference supply.

☒ YES: (If yes, check toxicity potential number below)☐ NO: (If no, go to Factor 5)

Determine the *Human Health* potential from Appendix A. Use the same SIC doe and subcategory reference as in Factor 1.
 (Be sure to use the *Human Health* toxicity group column – check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
<input type="checkbox"/> No process waste streams	0	0	<input type="checkbox"/> 3.	3	0	<input checked="" type="checkbox"/> 7.	7	15
<input type="checkbox"/> 1.	1	0	<input type="checkbox"/> 4.	4	0	<input type="checkbox"/> 8.	8	20
<input type="checkbox"/> 2.	2	0	<input type="checkbox"/> 5.	5	5	<input type="checkbox"/> 9.	9	25
			<input type="checkbox"/> 6.	6	10	<input type="checkbox"/> 10.	10	30

Code Number Checked:

7

Total Points Factor 4:**15**

NPDES PERMIT RATING WORK SHEET

FACTOR 5: Water Quality Factors

- A. Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-based federal effluent guidelines or technology-based state effluent guidelines) or has a wasteload allocation been given to the discharge?

	Code	Points
<input checked="" type="checkbox"/> YES	1	10
<input type="checkbox"/> NO	2	0

- B. Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?

	Code	Points
<input type="checkbox"/> YES	1	0
<input checked="" type="checkbox"/> NO	2	5

- C. Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?

	Code	Points
<input checked="" type="checkbox"/> YES	1	10
<input type="checkbox"/> NO	2	0

Code Number Checked: A 1 B 2 C 1
Points Factor 5: A 10 + B 5 + C 10 = 25

FACTOR 6: Proximity to Near Coastal Waters

- A. Base Score: Enter flow code here (from factor 2) 21

Check appropriate facility HPRI code (from PCS):

Enter the multiplication factor that corresponds to the flow code: 0.3

HPRI#	Code	HPRI Score	Flow Code	Multiplication Factor
<input type="checkbox"/> 1	1	20	11, 31, or 41	0.00
<input type="checkbox"/> 2	2	0	12, 32, or 42	0.05
<input checked="" type="checkbox"/> 3	3	30	13, 33, or 43	0.10
<input type="checkbox"/> 4	4	0	14 or 34	0.15
<input type="checkbox"/> 5	5	20	21 or 51	0.10
			22 or 52	0.30
			23 or 53	0.60
			24	1.00

HPRI code checked: 3

Base Score (HPRI Score): 30 X (Multiplication Factor) 0.1 = 9

- B. Additional Points – NEP Program

For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?

Code	Points
<input type="checkbox"/> 1	10
<input checked="" type="checkbox"/> 2	0

- C. Additional Points – Great Lakes Area of Concern

For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 areas of concern (see instructions)?

Code	Points
<input type="checkbox"/> 1	10
<input checked="" type="checkbox"/> 2	0

Code Number Checked: A 4 B N/A C N/A
Points Factor 6: A 0 + B 0 + C 0 = 0

NPDES PERMIT RATING WORK SHEET

SCORE SUMMARY

<u>Factor</u>	<u>Description</u>	<u>Total Points</u>
1	Toxic Pollutant Potential	35
2	Flows / Streamflow Volume	10
3	Conventional Pollutants	5
4	Public Health Impacts	15
5	Water Quality Factors	10
6	Proximity to Near Coastal Waters	0
	TOTAL (Factors 1 through 6)	75

S1. Is the total score equal to or greater than 80 ☐ YES; (Facility is a Major) ☒ NO

S2. If the answer to the above questions is no, would you like this facility to be discretionary major?

☒ NO

☐ YES; (Add 500 points to the above score and provide reason below:

Reason: _____

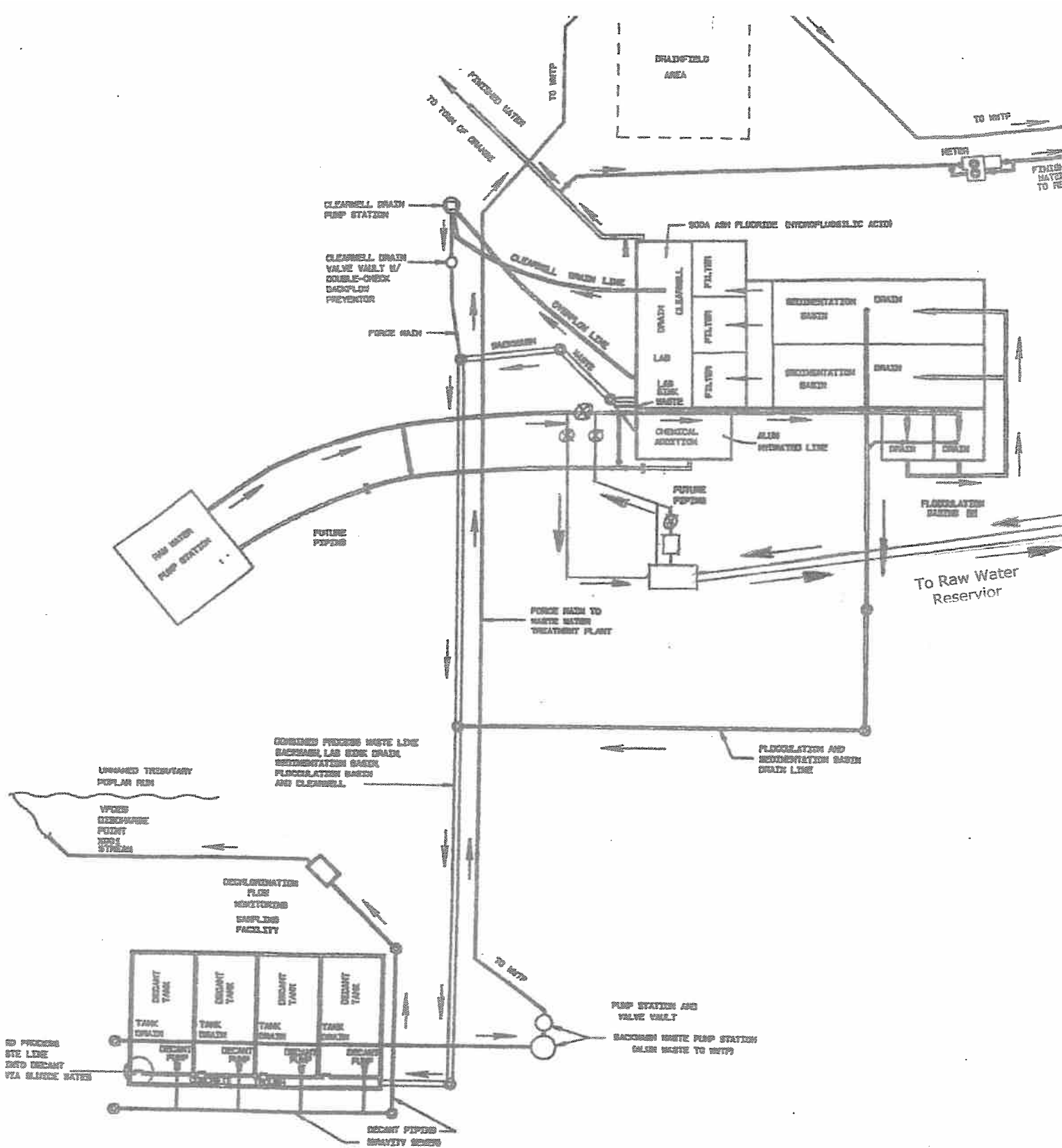
NEW SCORE : 75

OLD SCORE : 70

Permit Reviewer's Name : Anna Westernik

Phone Number: 703-583-3837

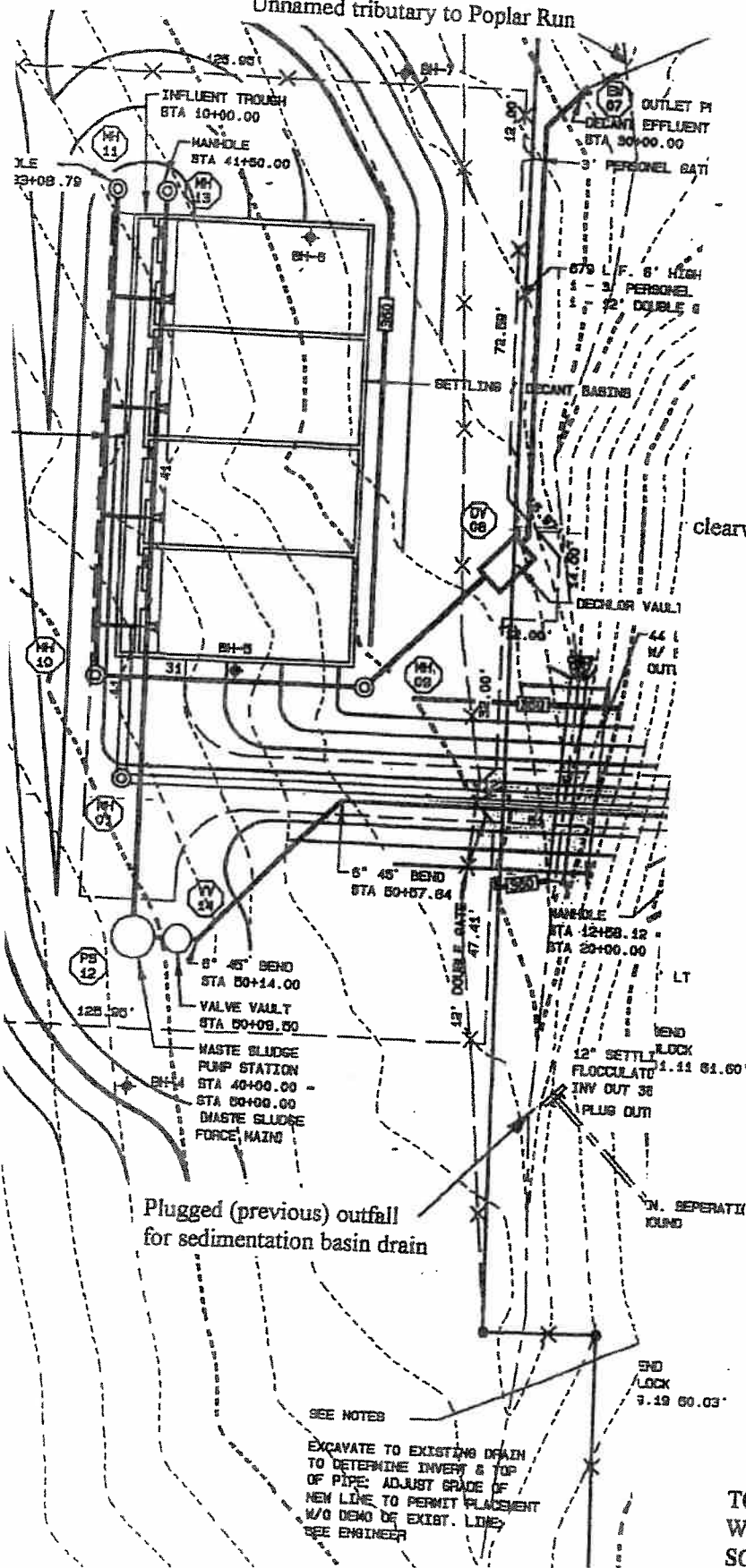
Date: May 27, 2010



TOWN OF ORANGE
WATER TREATMENT PLANT
FLOW SCHEMATIC
VPDES DISCHARGE

SCALE: 1" = 50'-0"

Unnamed tributary to Poplar Run



TOWN OF ORANGE
WATER TREATMENT PLANT
SCALE: 1" = 32'-4"

VPDES Active Permits in Waterbody VAN-013R

<u>Permit No</u>	<u>Facility Name</u>	<u>Latitude/Longitude</u>	<u>Receiving Stream</u>	<u>County Name</u>	<u>Major/Minor</u>	<u>Municipal/Industrial</u>
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VPDES Individual Permits

VA0021385	Orange Town Sewage Treatment Plant	38 15 57/78 9 21	Rapidan River	Orange County	Major	Municipal
VA0027839	Woodberry Forest School	38 17 18/78 6 42	Rapidan River	Madison County	Minor	Municipal
VA0053121	Orange Town Water Treatment Plant	38 15 50/78 9 22	UT of Poplar Run	Orange County	Minor	Industrial
VA0060879	Rapidan Baptist Camp and Conference Center	38 16 53/78 18 0	UT of Rapidan River	Madison County	Minor	Municipal

Stormwater General Permits

VAR051416	Madison County Landfill and Transfer Station		Rapidan River, UT	Madison County	NA	NA
VAR051419	Orange Town Sewage Treatment Plant		Laurel Run/Poplar Run	Orange County	NA	NA
VAR051040	American Woodmark -- Orange Dimension Plant		Laurel Run, UT	Orange County	NA	NA

Single Family Home Permits

VAG-406450	Rutt David Property		Laurel Run, UT	Orange County	NA	NA
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**Town of Orange
Water Treatment Plant**

12996 Spicers Mill Road, Orange, Virginia 22960-2125

Phone: (540) 672-1181 Fax (540) 672-0785

E-mail: waterplant@townoforangeva.org

Date: 4 / 9 / 2010

Subject: Chemicals On Hand @ Orange Water Treatment Plant.

Permit Writer,

Aluminum Sulfate	50 lb. grnd bag	= 320
Lime Hydrated	50 lb. powdr bag	= 80
Soda Ash Light	50 lb. grnd bag	= 80
Polymer Everfloc	50 lb dry bag	= 5
Chlorine	150 lb. lqgas cylinder	= 10
Hydrofluosilicic Acid	150 lb. liq epoly drum	= 6
Earthtec Algicide	55 gal liq drum	= 2
Potassium Permangante	150 kg cryst drum	= 3
Sodium Metabisulfite	50 lb. grnd bag	= 4

Thank You,
Dwight Baker
Chief Operator
Town of Orange WTP.



**Town of Orange
Water Treatment Plant**

12996 Spicers Mill Road, Orange, Virginia 22960-2125

Phone: (540) 672-1181 Fax (540) 672-0785

E-mail: waterplant@townoforangeva.org

Date: 5 / 24 / 2010

To: VA Department of Environmental Quality
Northern Virginia Regional Office
13901 Crown Court
Woodbridge, VA 22193

**Attention: Anna Westernik,
Environmental Specialist II
Certified Nutrient Management Planner #372**

Subject: Spill Prevention Materials List
Town of Orange Water Treatment Plant
PWSID # 6137500
VPDES permit # VA0053121

Materials on hand at the Town Water Treatment Plant for spill prevention / containment.

- Universal Absorbent, Zep Super Sorbent product # 2359 (15) - 2lb. cartons.
- Absorbent Spill Pads, oil only, New Pig product # MAT403 (3) bags approx 250 pads.
- Absorbent Spill Pads, Universal, New Pig product # MAT204 (2) bags 400 pads.
- Water Broom, Sponge Sorbent Products, (2) 10' booms.
- Repair Putty / Plug, Pig multi-purpose repair putty product # PTY201

Thank You,
Dwight Baker
Chief Operator
Town of Orange
Water Treatment Plant
(540) 672-1181

May 21, 2010

MEMORANDUM

To: 2010 VPDES Permit Reissuance File
Town of Orange WTP (VA0053121)

From: Anna Westernik, Water Permit Writer

Subject: May 13, 2010 Site Visit to the Town of Orange WTP

On May 13, 2010 Rebecca Johnson, DEQ-NRO wastewater inspector, and myself visited the Town of Orange WTP for the purpose of touring and observing facility operations prior to reissuance of the permit. Dwight Baker, Chief Operator for the Town of Orange WTP, and Tim Hudson of the Town of Orange WTP accompanied us during the inspection.

The Town of Orange Water Treatment Plant (WTP) produces potable water for the Town of Orange and the Rapidan Service Authority that serves Orange County. The Town withdraws water from the Rapidan River, upstream from its confluence with Poplar Run, and stores it in a 45 MG raw water reservoir.

From the reservoir, water is then pumped up to the WTP where alum and lime are added before the water flows into twin flocculation basins. Once a floc is formed, the flows enter twin sedimentation basins. After settling occurs, water flows inside the building, for filtration by three conventional sand filters. After filtration soda ash, hydrofluorosilic acid, and chlorine are added prior to storage in the clear wells and eventual distribution to the system.

There is considerable chemical storage at this facility that lacks secondary containment. On this date, I informed Dwight Baker and Tim Hudson that there needs to be secondary containment for chemical storage or chemicals must be stored in a sealed room without an open floor drain.

Backwash and sedimentation basin cleanout wastewater discharges daily to one of four decant basins, each sized to hold 0.06 MG. Decant basin-settled solids are pumped to the Town of Orange WWTP for additional treatment and disposal. "Decant" wastewater is tested for the presence of residual chlorine before being discharged via the H-flume to the Unnamed Tributary (UT) of Poplar Run. When chlorine is detected, operators manually start the automated dechlorination system that feeds sodium metabisulfite to the wastewater immediately prior to its discharge into the flume. Wastewater is retained in the decant basins for at least 24 hrs. prior to discharge. Additional wastewater flow occurs quarterly when the flocculation and sedimentation basins are cleaned and annually when the clearwell is drained. The facility discharges an average of 6 hours per day/5 days per week.

On this date, there was discharge to the unnamed tributary to Poplar Run. Additionally, drainage ditches along Spicer's Mill Road were flowing to this UT of Poplar Run. Some cloudiness in the water column of Poplar Run was observed. However, it had rained recently and the Town of Orange WWTP is conducting considerable construction next to Poplar Run.

To: Anna Westernik
From: Jennifer O'Reilly

Date: May 24, 2010
Subject: Planning Statement for the Town of Orange WTP
Permit No: VA0053121

Discharge Type: Industrial
Discharge Flow: 0.14 MGD Maximum 30-Day Value

Receiving Stream: UT - Poplar Run
Latitude / Longitude: 38°15'50" / 78°9'22"
Waterbody ID: E13/RA30
Water Quality Standards: Class III, Section 4

1. Is there monitoring data for the receiving stream?

There are no DEQ monitoring stations on the unnamed tributary to Poplar Run.

- If yes, please attach latest summary.
- If no, where is the nearest downstream monitoring station.

The nearest DEQ monitoring station is 3-RAP045.08, located 3.3 miles downstream of Outfall 001, on the Rapidan River at the Route 15 bridge crossing. This station is located in assessment unit VAN-E13R_RAP01A00, which begins at the confluence with Poplar Run and continues downstream until the confluence with the Robinson River.

The following is a monitoring summary for station 3-RAP045.08 as found in the 2008 Integrated Assessment:

Class III, Section 4.

E. coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. The aquatic life and wildlife uses are considered fully supporting. The fish consumption use was not assessed.

2. Is the receiving stream on the current 303(d) list? No.

- If yes, what is the impairment? N/A
- Has the TMDL been prepared? N/A
- If yes, what is the WLA for the discharge? N/A
- If no, what is the schedule for the TMDL? N/A

The Rapidan River Bacteria TMDL was approved by EPA on 12/5/2007.

The TMDL for segments VAN-E16R_RAP03A08 and VAN-E16R_RAP01A04 are scheduled to be due by 2020 and 2018, respectively; however, with the approval of the 2010 Assessment Guidance, a TMDL will not be required for these segments because they are "nested" within a completed bacteria TMDL. The bacteria sources in these impaired segments were already taken into account during the development of the Rapidan River Basin Bacteria TMDL.

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

There are no other needs at this time.

5. Could you please calculate the drainage area at the outfall?

The drainage area at the outfall is 0.07 mi².

E15

DEQ Monitoring Station
3-RAP045.08

280

280

E16

VAN EICK RAP01A00

Madison

Rapidan River

E13

Outfall 001

Orange

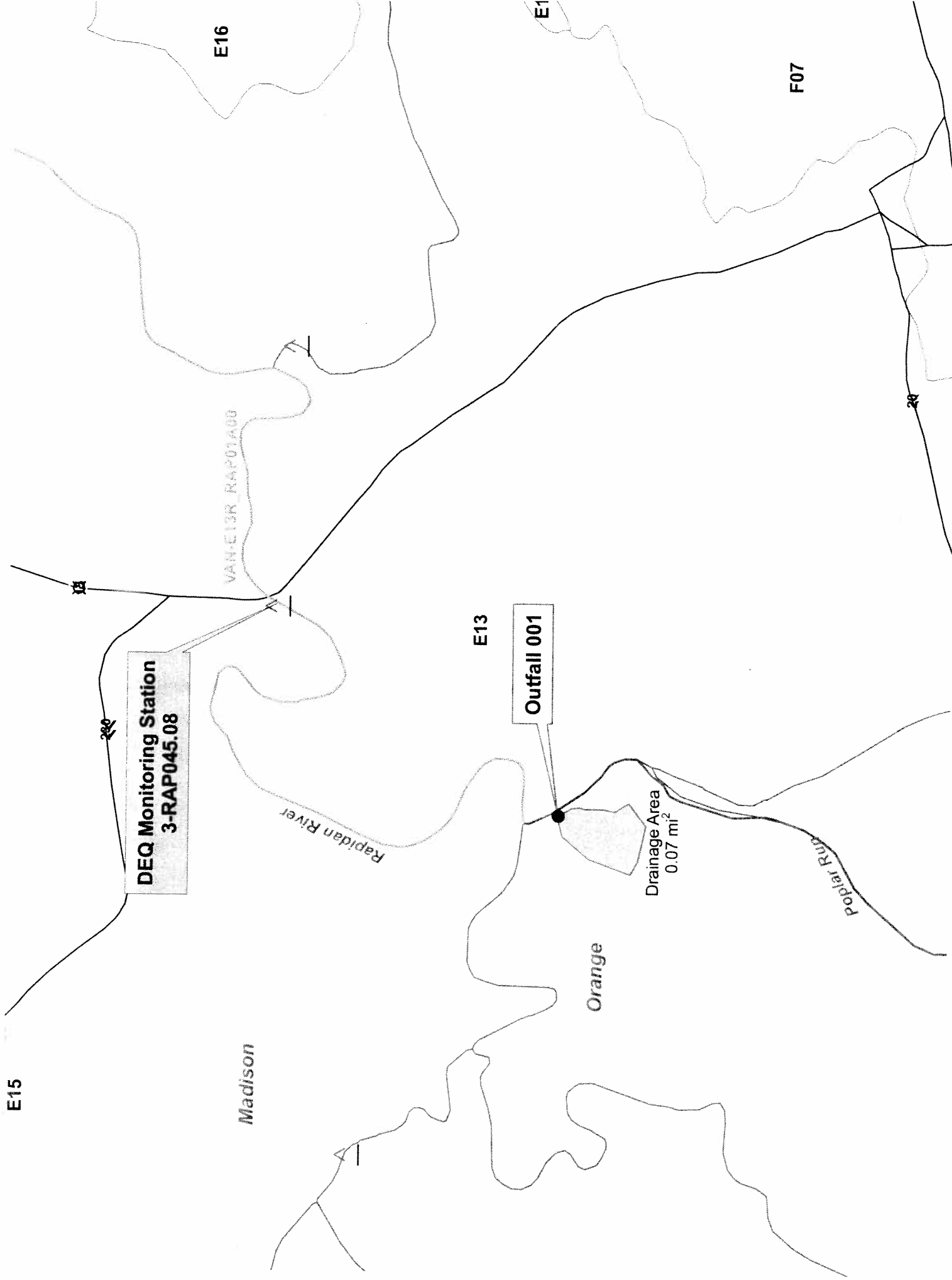
Drainage Area
0.07 mi²

E1

F07

Polar Run

280



FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Orange WTP

Permit No.: VA0012345

Receiving Stream: UT to Poplar Run

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO₃) = mg/L
 90% Temperature (Annual) = deg C
 90% Temperature (Wet season) = deg C
 90% Maximum pH = SU
 10% Maximum pH = SU
 Tier Designation (1 or 2) = 1
 Public Water Supply (PWS) Y/N? = n
 Trout Present Y/N? = n
 Early Life Stages Present Y/N? = y

Stream Flows

1Q10 (Annual) = 0 MGD
 7Q10 (Annual) = 0 MGD
 30Q10 (Annual) = 0 MGD
 1Q10 (Wet season) = 0 MGD
 30Q10 (Wet season) = 0 MGD
 30Q5 = 0 MGD
 Harmonic Mean = 0 MGD

Mixing Information

Annual - 1Q10 Mix = 100 %
 - 7Q10 Mix = 100 %
 - 30Q10 Mix = 100 %
 Wet Season - 1Q10 Mix = 100 %
 - 30Q10 Mix = 100 %

Effluent Information

Mean Hardness (as CaCO₃) = 33 mg/L
 90% Temp (Annual) = deg C
 90% Temp (Wet season) = deg C
 90% Maximum pH = SU
 10% Maximum pH = SU
 Discharge Flow = 0.14 MGD

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)
Acenaphthene	0	--	--	na	9.9E+02	--	--	na	9.9E+02	--	--	--	--	--	--	na
Acrolein	0	--	--	na	9.3E+00	--	--	na	9.3E+00	--	--	--	--	--	--	na
Acrylonitrile ^C	0	--	--	na	2.5E+00	--	--	na	2.5E+00	--	--	--	--	--	--	na
Aldrin ^C	0	3.0E+00	--	na	5.0E-04	3.0E+00	--	na	5.0E-04	--	--	--	--	3.0E+00	--	na
Ammonia-N (mg/l)	0	5.84E+01	7.09E+00	na	--	5.8E+01	7.1E+00	na	--	--	--	--	--	5.8E+01	7.1E+00	na
Ammonia-N (mg/l) (High Flow)	0	5.84E+01	7.09E+00	na	--	5.8E+01	7.1E+00	na	--	--	--	--	--	5.8E+01	7.1E+00	na
Anthracene	0	--	--	na	4.0E+04	--	--	na	4.0E+04	--	--	--	--	--	--	na
Antimony	0	--	--	na	6.4E+02	--	--	na	6.4E+02	--	--	--	--	--	--	na
Arsenic	0	3.4E+02	1.5E+02	na	--	3.4E+02	1.5E+02	na	--	--	--	--	--	3.4E+02	1.5E+02	na
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na
Benzene ^C	0	--	--	na	5.1E+02	--	--	na	5.1E+02	--	--	--	--	--	--	na
Benzidine ^C	0	--	--	na	2.0E-03	--	--	na	2.0E-03	--	--	--	--	--	--	na
Benzo (a) anthracene ^C	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	na
Benzo (b) fluoranthene ^C	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	na
Benzo (k) fluoranthene ^C	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	na
Benzo (a) pyrene ^C	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	na
Bis(2-Chloroethyl) Ether ^C	0	--	--	na	5.3E+00	--	--	na	5.3E+00	--	--	--	--	--	--	na
Bis(2-Chloroisopropyl) Ether	0	--	--	na	6.5E+04	--	--	na	6.5E+04	--	--	--	--	--	--	na
Bis 2-Ethylhexyl Phthalate ^C	0	--	--	na	2.2E+01	--	--	na	2.2E+01	--	--	--	--	--	--	na
Bromofom ^C	0	--	--	na	1.4E+03	--	--	na	1.4E+03	--	--	--	--	--	--	na
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	1.9E+03	--	--	--	--	--	--	na
Cadmium	0	1.1E+00	4.7E-01	na	--	1.1E+00	4.7E-01	na	--	--	--	--	--	1.1E+00	4.7E-01	na
Carbon Tetrachloride ^C	0	--	--	na	1.6E+01	--	--	na	1.6E+01	--	--	--	--	--	--	na
Chlordane ^C	0	2.4E+00	4.3E-03	na	8.1E-03	2.4E+00	4.3E-03	na	8.1E-03	--	--	--	--	2.4E+00	4.3E-03	na
Chloride	0	8.6E+05	2.3E+05	na	--	8.6E+05	2.3E+05	na	--	--	--	--	--	8.6E+05	2.3E+05	na

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)
TRC	0	1.9E+01	1.1E+01	na	---	1.9E+01	1.1E+01	na	--	--	--	--	--	1.9E+01	1.1E+01	na
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	1.6E+03

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane ^c	0	--	--	na	1.3E+02	--	--	na	1.3E+02	--	--	--	--	--	--	--	--	--	--	na	1.3E+02
Chloroform ^c	0	--	--	na	1.1E+04	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+04
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	1.6E+03
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	1.5E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--
Chromium III	0	2.3E+02	3.0E+01	na	--	2.3E+02	3.0E+01	na	--	2.3E+02	3.0E+01	na	--	2.3E+02	3.0E+01	na	--	2.3E+02	3.0E+01	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Chrysene ^c	0	--	--	na	1.8E-02	--	--	na	1.8E-02	--	--	--	--	--	--	--	--	--	--	na	1.8E-02
Copper ^c	0	4.7E+00	3.5E+00	na	--	4.7E+00	3.5E+00	na	--	4.7E+00	3.5E+00	na	--	4.7E+00	3.5E+00	na	--	4.7E+00	3.5E+00	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	2.2E+01	5.2E+00	na	1.6E+04	2.2E+01	5.2E+00	na	1.6E+04	2.2E+01	5.2E+00	na	1.6E+04	2.2E+01	5.2E+00	na	1.6E+04
DDD ^c	0	--	--	na	3.1E-03	--	--	na	3.1E-03	--	--	--	--	--	--	--	--	--	--	na	3.1E-03
DDE ^c	0	--	--	na	2.2E-03	--	--	na	2.2E-03	--	--	--	--	--	--	--	--	--	--	na	2.2E-03
DDT ^c	0	1.1E+00	1.0E-03	na	2.2E-03	1.1E+00	1.0E-03	na	2.2E-03	1.1E+00	1.0E-03	na	2.2E-03	1.1E+00	1.0E-03	na	2.2E-03	1.1E+00	1.0E-03	na	2.2E-03
Demeton	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	1.0E-01	na	--	--	1.0E-01	na	--	--	1.0E-01	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	1.7E-01	1.7E-01	na	--	1.7E-01	1.7E-01	na	--	1.7E-01	1.7E-01	na	--	1.7E-01	1.7E-01	na	--
Dibenz(a,h)anthracene ^c	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	1.3E+03	--	--	--	--	--	--	--	--	--	--	na	1.3E+03
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	9.6E+02	--	--	--	--	--	--	--	--	--	--	na	9.6E+02
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	1.9E+02	--	--	--	--	--	--	--	--	--	--	na	1.9E+02
3,3-Dichlorobenzidine ^c	0	--	--	na	2.8E-01	--	--	na	2.8E-01	--	--	--	--	--	--	--	--	--	--	na	2.8E-01
Dichlorobromomethane ^c	0	--	--	na	1.7E+02	--	--	na	1.7E+02	--	--	--	--	--	--	--	--	--	--	na	1.7E+02
1,2-Dichloroethane ^c	0	--	--	na	3.7E+02	--	--	na	3.7E+02	--	--	--	--	--	--	--	--	--	--	na	3.7E+02
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	7.1E+03	--	--	--	--	--	--	--	--	--	--	na	7.1E+03
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.0E+04	--	--	--	--	--	--	--	--	--	--	na	1.0E+04
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	2.9E+02	--	--	--	--	--	--	--	--	--	--	na	2.9E+02
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
1,2-Dichloropropane ^c	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	1.5E+02
1,3-Dichloropropene ^c	0	--	--	na	2.1E+02	--	--	na	2.1E+02	--	--	--	--	--	--	--	--	--	--	na	2.1E+02
Dieldrin ^c	0	2.4E-01	5.6E-02	na	5.4E-04	2.4E-01	5.6E-02	na	5.4E-04	2.4E-01	5.6E-02	na	5.4E-04	2.4E-01	5.6E-02	na	5.4E-04	2.4E-01	5.6E-02	na	5.4E-04
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	4.4E+04	--	--	--	--	--	--	--	--	--	--	na	4.4E+04
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	8.5E+02	--	--	--	--	--	--	--	--	--	--	na	8.5E+02
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	1.1E+06	--	--	--	--	--	--	--	--	--	--	na	1.1E+06
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	4.5E+03	--	--	--	--	--	--	--	--	--	--	na	4.5E+03
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	5.3E+03
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	2.8E+02	--	--	--	--	--	--	--	--	--	--	na	2.8E+02
2,4-Dinitrotoluene ^c	0	--	--	na	3.4E+01	--	--	na	3.4E+01	--	--	--	--	--	--	--	--	--	--	na	3.4E+01
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	5.1E-08	--	--	--	--	--	--	--	--	--	--	na	5.1E-08
1,2-Diphenylhydrazine ^c	0	--	--	na	2.0E+00	--	--	na	2.0E+00	--	--	--	--	--	--	--	--	--	--	na	2.0E+00
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	8.9E+01	--	--	--	--	--	--	--	--	--	--	na	8.9E+01
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	8.6E-02	3.6E-02	na	6.0E-02	8.6E-02	3.6E-02	na	6.0E-02	8.6E-02	3.6E-02	na	6.0E-02	8.6E-02	3.6E-02	na	6.0E-02

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	3.0E-01	--	--	--	--	--	--	3.0E-01

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	2.1E+03	--	--	--	--	--	--	--	--	--	--	na	2.1E+03
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	1.4E+02	--	--	--	--	--	--	--	--	--	--	na	1.4E+02
Fluorene	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	5.3E+03
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.0E-02	na	--	--	--	--	--	--	--	--	--	--	1.0E-02	na	--
Hephtachlor ^C	0	5.2E-01	3.8E-03	na	7.9E-04	5.2E-01	3.8E-03	na	7.9E-04	5.2E-01	3.8E-03	na	7.9E-04	5.2E-01	3.8E-03	na	7.9E-04	5.2E-01	3.8E-03	na	7.9E-04
Heptachlor Epoxide ^C	0	5.2E-01	3.8E-03	na	3.9E-04	5.2E-01	3.8E-03	na	3.9E-04	5.2E-01	3.8E-03	na	3.9E-04	5.2E-01	3.8E-03	na	3.9E-04	5.2E-01	3.8E-03	na	3.9E-04
Hexachlorobenzene ^C	0	--	--	na	2.9E-03	--	--	na	2.9E-03	--	--	--	--	--	--	--	--	--	--	na	2.9E-03
Hexachlorobutadiene ^C	0	--	--	na	1.8E+02	--	--	na	1.8E+02	--	--	--	--	--	--	--	--	--	--	na	1.8E+02
Hexachlorocyclohexane	0	--	--	na	4.9E-02	--	--	na	4.9E-02	--	--	--	--	--	--	--	--	--	--	na	4.9E-02
Alpha-BHC ^C	0	--	--	na	1.7E-01	--	--	na	1.7E-01	--	--	--	--	--	--	--	--	--	--	na	1.7E-01
Hexachlorocyclohexane	0	9.5E-01	na	na	1.8E+00	9.5E-01	--	na	1.8E+00	--	--	--	--	--	--	--	--	9.5E-01	--	na	1.8E+00
Beta-BHC ^C	0	--	--	na	1.1E+03	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03
Gamma-BHC ^C (Lindane)	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	--	--	na	3.3E+01
Hexachlorocyclopentadiene	0	--	2.0E+00	na	--	--	2.0E+00	na	--	--	--	--	--	--	--	--	--	--	2.0E+00	na	--
Hexachloroethane ^C	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Hydrogen Sulfide	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Indeno (1,2,3-cd) pyrene ^C	0	--	--	na	9.6E+03	--	--	na	9.6E+03	--	--	--	--	--	--	--	--	--	--	na	9.6E+03
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone ^C	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Kepone	0	2.9E+01	3.3E+00	na	--	2.9E+01	3.3E+00	na	--	2.9E+01	3.3E+00	na	--	2.9E+01	3.3E+00	na	--	2.9E+01	3.3E+00	na	--
Lead	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Malathion	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	--	--	1.4E+00	7.7E-01	--	--	1.4E+00	7.7E-01	--	--	1.4E+00	7.7E-01	--	--	1.4E+00	7.7E-01	--	--
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	--	--	na	1.5E+03
Methylene Chloride ^C	0	--	--	na	5.9E+03	--	--	na	5.9E+03	--	--	--	--	--	--	--	--	--	--	na	5.9E+03
Methoxychlor	0	--	3.0E-02	na	--	--	3.0E-02	na	--	--	--	--	--	--	--	--	--	--	3.0E-02	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Nickel	0	7.1E+01	7.9E+00	na	4.6E+03	7.1E+01	7.9E+00	na	4.6E+03	7.1E+01	7.9E+00	na	4.6E+03	7.1E+01	7.9E+00	na	4.6E+03	7.1E+01	7.9E+00	na	4.6E+03
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	6.9E+02	--	--	--	--	--	--	--	--	--	--	na	6.9E+02
N-Nitrosodimethylamine ^C	0	--	--	na	3.0E+01	--	--	na	3.0E+01	--	--	--	--	--	--	--	--	--	--	na	3.0E+01
N-Nitrosodiphenylamine ^C	0	--	--	na	6.0E+01	--	--	na	6.0E+01	--	--	--	--	--	--	--	--	--	--	na	6.0E+01
N-Nitrosodi-n-propylamine ^C	0	--	--	na	5.1E+00	--	--	na	5.1E+00	--	--	--	--	--	--	--	--	--	--	na	5.1E+00
Nonylphenol	0	2.8E+01	6.6E+00	--	--	2.8E+01	6.6E+00	na	--	2.8E+01	6.6E+00	na	--	2.8E+01	6.6E+00	na	--	2.8E+01	6.6E+00	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--
PCB Total ^C	0	--	1.4E-02	na	6.4E-04	--	1.4E-02	na	6.4E-04	--	1.4E-02	na	6.4E-04	--	1.4E-02	na	6.4E-04	--	1.4E-02	na	6.4E-04
Pentachlorophenol ^C	0	7.7E-03	5.9E-03	na	3.0E+01	7.7E-03	5.9E-03	na	3.0E+01	7.7E-03	5.9E-03	na	3.0E+01	7.7E-03	5.9E-03	na	3.0E+01	7.7E-03	5.9E-03	na	3.0E+01
Phenol	0	--	--	na	8.6E+05	--	--	na	8.6E+05	--	--	--	--	--	--	--	--	--	--	na	8.6E+05
Pyrene	0	--	--	na	4.0E+03	--	--	na	4.0E+03	--	--	--	--	--	--	--	--	--	--	na	4.0E+03
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	4.0E+00	--	--	--	--	--	--	--	--	--	--	na	4.0E+00

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na
Uranium (ug/l)	0	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	2.0E+01	5.0E+00	na	4.2E+03	--	--	--	--	2.0E+01	5.0E+00	na
Silver	0	5.1E-01	--	na	--	5.1E-01	--	na	--	--	--	--	--	5.1E-01	--	na
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na
1,1,2,2-Tetrachloroethane ^C	0	--	--	na	4.0E+01	--	--	na	4.0E+01	--	--	--	--	--	--	na
Tetrachloroethylene ^C	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	na
Thallium	0	--	--	na	4.7E-01	--	--	na	4.7E-01	--	--	--	--	--	--	na
Toluene	0	--	--	na	6.0E+03	--	--	na	6.0E+03	--	--	--	--	--	--	na
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na
Toxaphene ^C	0	7.3E-01	2.0E-04	na	2.8E-03	7.3E-01	2.0E-04	na	2.8E-03	--	--	--	--	7.3E-01	2.0E-04	na
Tributyltin	0	4.6E-01	7.2E-02	na	--	4.6E-01	7.2E-02	na	--	--	--	--	--	4.6E-01	7.2E-02	na
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	7.0E+01	--	--	--	--	--	--	na
1,1,2-Trichloroethane ^C	0	--	--	na	1.6E+02	--	--	na	1.6E+02	--	--	--	--	--	--	na
Trichloroethylene ^C	0	--	--	na	3.0E+02	--	--	na	3.0E+02	--	--	--	--	--	--	na
2,4,6-Trichlorophenol ^C	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	na
2-(2,4,5-Trichlorophenoxy)propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na
Vinyl Chloride ^C	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na
Zinc	0	4.6E+01	4.6E+01	na	2.6E+04	4.6E+01	4.6E+01	na	2.6E+04	--	--	--	--	4.6E+01	4.6E+01	na

Notes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- Discharge flow is highest monthly average or Form 2C maximum for industries and design flow for Municipals
- Metals measured as Dissolved, unless specified otherwise
- "C" indicates a carcinogenic parameter
- Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
Antidegradation WLAs are based upon a complete mix.
Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
= (0.1(WQC - background conc.) + background conc.) for human health
- WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1) effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	6.4E+02
Arsenic	9.0E+01
Barium	na
Cadmium	2.8E-01
Chromium III	1.8E+01
Chromium VI	6.4E+00
Copper	1.9E+00
Iron	na
Lead	2.0E+00
Manganese	na
Mercury	4.6E-01
Nickel	4.8E+00
Selenium	3.0E+00
Silver	2.0E-01
Zinc	1.8E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance



HRSD • CENTRAL ENVIRONMENTAL LABORATORY
1432 AIR RAIL AVE., VIRGINIA BEACH, VIRGINIA 23455-3002 • (757) 460-4205 • FAX: (757) 460-6586

ANALYTICAL REPORT

www.hrsd.com

Project: Town of Orange WTP - Permit Application
Customer Sample ID: Final Effluent
Project Code: OR_WTP
Sample Point: FNE
Sample Date: 03/23/10

Analyte	Method	Unit	Result	Report Limit	Analyst	Analysis Date	Analysis Time
<u>Misc. Parameters</u>							
BOD	SM 5210B	mg/L	<2	2	JRICKS	03/24/10	09:20
COD	HACH 8000	mg/L	<25	25	KWILLI	04/01/10	09:00
Total Organic Carbon	SM5310C	mg/L	1.34	1.00	RMORGA	04/05/10	16:03
Total Suspended Solids	SM2540D	mg/L	1.0	1.0	DRAIFO	03/24/10	10:27
Ammonia-N w/Distillation	EPA 350.1	mg/L	<0.20	0.20	LREED	03/31/10	11:34
Nitrate/Nitrite-Nitrogen (NO _x)	EPA 353.2	mg/L	0.47	0.20	GMCCAR	03/25/10	15:40
Total Kjeldahl Nitrogen	EPA 351.2	mg/L	<0.50	0.50	VJOHNS	03/26/10	11:29
Total Nitrogen	Calculation	mg/L	<0.50	0.50			
Fluoride	SM4500F-C	mg/L	<0.4	0.4	RMORGA	03/25/10	14:02
Sulfate	EPA 375.4	mg/L	27.1	5.0	RMORGA	03/25/10	08:00
Surfactants	SM5540C	mg/L	<0.05	0.05	RMORGA	03/24/10	07:56
<u>Dissolved Metals</u>							
Aluminum	EPA 200.7	ug/L	<30	30	SWILLI	03/31/10	11:57
Boron	EPA 200.7	ug/L	<20	20	SWILLI	04/06/10	14:41
Iron	EPA 200.7	ug/L	<100	100	SWILLI	04/06/10	10:11
Magnesium	EPA 200.7	ug/L	2010	20	SWILLI	04/06/10	10:11
Tin	EPA 200.7	ug/L	<60	60	SWILLI	04/06/10	10:11
Titanium	EPA 200.7	ug/L	<30	30	SWILLI	04/05/10	16:40
Barium	EPA 200.8	ug/L	16	10	CBATO	04/01/10	14:19
Cobalt	EPA 200.8	ug/L	<1.0	1.0	CBATO	04/01/10	14:19
Molybdenum	EPA 200.8	ug/L	<1.0	1.0	CBATO	04/01/10	14:19
Manganese	EPA 200.8	ug/L	5.6	5.0	CBATO	04/01/10	14:19
Antimony	EPA 200.8	ug/L	<20	20	CBATO	04/01/10	14:19
Arsenic	EPA 200.8	ug/L	<20	20	CBATO	04/01/10	14:19
Beryllium	EPA 200.8	ug/L	<1.0	1.0	CBATO	04/01/10	14:19
Cadmium	EPA 200.8	ug/L	<0.1	0.1	CBATO	04/01/10	14:19
Chromium	EPA 200.8	ug/L	<5.0	5.0	CBATO	04/01/10	14:19
Copper	EPA 200.8	ug/L	1.4	1.0	CBATO	04/01/10	14:19
Lead	EPA 200.8	ug/L	<1.0	1.0	CBATO	04/01/10	14:19
Mercury	EPA 245.1	ug/L	<0.2	0.2	SLABOC	03/26/10	10:16
Nickel	EPA 200.8	ug/L	<2.0	2.0	CBATO	04/01/10	14:19
Selenium	EPA 200.8	ug/L	<2.0	2.0	CBATO	04/01/10	14:19
Silver	EPA 200.8	ug/L	<0.10	0.10	CBATO	04/01/10	14:19
Thallium	EPA 200.8	ug/L	<0.10	0.10	CBATO	04/01/10	14:19
Zinc	EPA 200.8	ug/L	<10	10	CBATO	04/01/10	14:19
<u>Volatile Organics - FNE</u>							
Chloroform	EPA 624	ug/L	29.0	10.0	SLOPEZ	03/25/10	22:41
<u>Notes</u>							

Report Limit is lowest concentration at which quantitation is demonstrated.

Authorization: Robin Parnell Date: 4/7/10

5/21/2010 4:49:59 PM

Facility = Town of Orange WTP

Chemical = Copper

Chronic averaging period = 4

WLAa = 4.7

WLAc =

Q.L. = 1

samples/mo. = 1

samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = 1.4

Variance = .7056

C.V. = 0.6

97th percentile daily values = 3.40678

97th percentile 4 day average = 2.32930

97th percentile 30 day average = 1.68847

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1.4

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

Northern Regional Office

13901 Crown Court

Woodbridge, VA 22193

(703) 583-3800

SUBJECT: TOXICS MANAGEMENT PROGRAM DATA REVIEW
Town of Orange Water Treatment Plant (VA0053121)
REVIEWER: Douglas Frasier
DATE: 15 April 2010
COPIES: TMP file

PREVIOUS REVIEW: 13 November 2009

DATA REVIEWED:

This review covers the retest acute toxicity test conducted in December 2009 for Outfall 001. The test was performed on *C. dubia* using a composite sample of final effluent collected from the outfall.

DISCUSSION:

The results of the acute toxicity test along with the results of previous toxicity tests conducted on the composite effluent samples collected from Outfall 001 are summarized in Table 1.

The acute toxicity of the effluent sample was determined with a 48-hour static acute toxicity test using both *C. dubia* as the test species. The acute test for *C. dubia* yielded a LC_{50} of > 100% effluent; passing the acute toxicity criterion for this test species.

The test results indicate that the effluent sample did not exhibit acute toxicity for the *C. dubia* species.

RECOMMENDATIONS: None

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated industrial wastewater into a water body in Orange County, Virginia.

PUBLIC COMMENT PERIOD: July 16, 2010 to 5:00 p.m. on August 16, 2010

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: The Town of Orange, 119 Bellevue Avenue, Orange, VA 22960; VA0053121

NAME AND ADDRESS OF FACILITY: The Town of Orange WTP, 12996 Spicer's Mill Road, Orange, VA 22960

PROJECT DESCRIPTION: The Town of Orange has applied for a reissuance of a permit for the public Orange Water Treatment Plant. The applicant proposes to release treated industrial wastewaters at a maximum rate of 0.2 million gallons per day into a water body. The industrial sludge from the treatment process will be disposed of by discharge to the Town of Orange Wastewater Treatment Plant. The facility proposes to release the treated industrial wastewaters into an unnamed tributary of Poplar Run in Orange County in the Rappahannock River watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, TSS and Chlorine. The facility will monitor for acute toxicity.

DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the documents at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.

Name: Anna Westernik

Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193

Phone: (703) 583-3837 E-mail: anna.westernik@deq.virginia.gov Fax: (703) 583-3821

**State "Transmittal Checklist" to Assist in Targeting
Municipal and Industrial Individual NPDES Draft Permits for Review**

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name:	The Town of Orange WTP
NPDES Permit Number:	VA0053121
Permit Writer Name:	Anna Westernik
Date:	June 3, 2010

Major ☐Minor ☒Industrial ☒Municipal ☐**I.A. Draft Permit Package Submittal Includes:**

	Yes	No	N/A
1. Permit Application?	x		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	x		
3. Copy of Public Notice?	x		
4. Complete Fact Sheet?	x		
5. A Priority Pollutant Screening to determine parameters of concern?	x		
6. A Reasonable Potential analysis showing calculated WQBELs?	x		
7. Dissolved Oxygen calculations?		x	
8. Whole Effluent Toxicity Test summary and analysis?	x		
9. Permit Rating Sheet for new or modified industrial facilities?	x		

I.B. Permit/Facility Characteristics

	Yes	No	N/A
1. Is this a new, or currently unpermitted facility?		x	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	x		
3. Does the fact sheet or permit contain a description of the wastewater treatment process?	x		
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		x	
5. Has there been any change in streamflow characteristics since the last permit was developed?		x	
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		x	
7. Does the fact sheet or permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	x		
8. Does the facility discharge to a 303(d) listed water?	x		
a. Has a TMDL been developed and approved by EPA for the impaired water?	x		x
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?			x
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?		x	
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?		x	
10. Does the permit authorize discharges of storm water?		x	

I.B. Permit/Facility Characteristics – cont.	Yes	No	N/A
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		x	
12. Are there any production-based, technology-based effluent limits in the permit?		x	
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		x	
14. Are any WQBELs based on an interpretation of narrative criteria?		x	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		x	
16. Does the permit contain a compliance schedule for any limit or condition?		x	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		x	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	x		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		x	
20. Have previous permit, application, and fact sheet been examined?	x		

Part II. NPDES Draft Permit Checklist

Region III NPDES Permit Quality Review Checklist – For Non-Municipals (To be completed and included in the record for all non-POTWs)

II.A. Permit Cover Page/Administration	Yes	No	N/A
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	x		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	x		

II.B. Effluent Limits – General Elements	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	x		
2. Does the fact sheet discuss whether “antibacksliding” provisions were met for any limits that are less stringent than those in the previous NPDES permit?	x		

II.C. Technology-Based Effluent Limits (Effluent Guidelines & BPJ)	Yes	No	N/A
1. Is the facility subject to a national effluent limitations guideline (ELG)?		x	
a. If yes, does the record adequately document the categorization process, including an evaluation of whether the facility is a new source or an existing source?			x
b. If no, does the record indicate that a technology-based analysis based on Best Professional Judgement (BPJ) was used for all pollutants of concern discharged at treatable concentrations?	x		
2. For all limits developed based on BPJ, does the record indicate that the limits are consistent with the criteria established at 40 CFR 125.3(d)?	x		
3. Does the fact sheet adequately document the calculations used to develop both ELG and /or BPJ technology-based effluent limits?		x	
4. For all limits that are based on production or flow, does the record indicate that the calculations are based on a “reasonable measure of ACTUAL production” for the facility (not design)?			x
5. Does the permit contain “tiered” limits that reflect projected increases in production or flow?		x	
a. If yes, does the permit require the facility to notify the permitting authority when alternate levels of production or flow are attained?			x
6. Are technology-based permit limits expressed in appropriate units of measure (e.g., concentration, mass, SU)?			x
7. Are all technology-based limits expressed in terms of both maximum daily, weekly average, and/or monthly average limits?			x
8. Are any final limits less stringent than required by applicable effluent limitations guidelines or BPJ?		x	

II.D. Water Quality-Based Effluent Limits	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	x		
2. Does the record indicate that any WQBELs were derived from a completed and EPA approved TMDL?		x	
3. Does the fact sheet provide effluent characteristics for each outfall?	x		
4. Does the fact sheet document that a “reasonable potential” evaluation was performed?	x		
a. If yes, does the fact sheet indicate that the “reasonable potential” evaluation was performed in accordance with the State’s approved procedures?	x		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	x		

II.D. Water Quality-Based Effluent Limits – cont.	Yes	No	N/A
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have “reasonable potential”?	x		
d. Does the fact sheet indicate that the “reasonable potential” and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations where data are available)?		x	
e. Does the permit contain numeric effluent limits for all pollutants for which “reasonable potential” was determined?	x		
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	x		
6. For all final WQBELs, are BOTH long-term (e.g., average monthly) AND short-term (e.g., maximum daily, weekly average, instantaneous) effluent limits established?	x		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	x		
8. Does the fact sheet indicate that an “antidegradation” review was performed in accordance with the State’s approved antidegradation policy?	x		

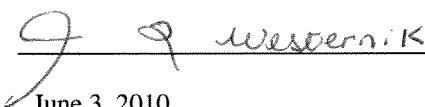
II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters?	x		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	x		
3. Does the permit require testing for Whole Effluent Toxicity in accordance with the State’s standard practices?	x		

II.F. Special Conditions	Yes	No	N/A
1. Does the permit require development and implementation of a Best Management Practices (BMP) plan or site-specific BMPs?		x	
a. If yes, does the permit adequately incorporate and require compliance with the BMPs?			x
2. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			x
3. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?			x

II.G. Standard Conditions	Yes	No	N/A
1. Does the permit contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	x		
List of Standard Conditions – 40 CFR 122.41 <div style="display: flex; justify-content: space-between;"> <div> Duty to comply Duty to reapply Need to halt or reduce activity not a defense Duty to mitigate Proper O & M Permit actions </div> <div> Property rights Duty to provide information Inspections and entry Monitoring and records Signatory requirement Bypass Upset </div> <div> Reporting Requirements Planned change Anticipated noncompliance Transfers Monitoring reports Compliance schedules 24-Hour reporting Other non-compliance </div> </div>			
2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for existing non-municipal dischargers regarding pollutant notification levels [40 CFR 122.42(a)]?	x		

Part III. Signature Page

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	<u>Anna T. Westernik</u>
Title	<u>Environmental Specialist II</u>
Signature	<u></u>
Date	<u>June 3, 2010</u>